US007229475B2

(12) **United States Patent**
Glazier

(10) **Patent No.: US 7,229,475 B2**
(45) **Date of Patent: Jun. 12, 2007**

(54) **MULTI-FOCAL INTRAOCULAR LENS, AND METHODS FOR MAKING AND USING SAME**

(75) Inventor: **Alan Glazier**, Rockville, MD (US)

(73) Assignee: **Vision Solutions Technologies, Inc.**, Rockville, MD (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 353 days.

(21) Appl. No.: **10/733,173**

(22) Filed: **Dec. 10, 2003**

(65) **Prior Publication Data**

US 2005/0071002 A1 Mar. 31, 2005

Related U.S. Application Data

(63) Continuation-in-part of application No. PCT/US02/17964, filed on Jun. 7, 2002, which is a continuation-in-part of application No. 10/158,574, filed on May 30, 2002, now Pat. No. 6,855,164, which is a continuation-in-part of application No. 10/139,144, filed on May 3, 2002, now abandoned.

(60) Provisional application No. 60/297,306, filed on Jun. 11, 2001.

(51) **Int. Cl.**
A61F 2/16 (2006.01)

(52) **U.S. Cl.** **623/6.13**; 623/6.37

(58) **Field of Classification Search** 623/4.1, 623/6.11, 6.13, 6.22, 6.23, 6.24, 6.27, 6.37, 623/6.56
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,437,642 A 3/1948 Henroteau
2,714,721 A 9/1955 Stone
2,834,023 A 5/1958 Lieb
3,598,479 A 8/1971 Wright et al.
3,614,215 A 10/1971 Mackta
3,673,616 A 7/1972 Fedorov et al.
3,711,870 A 1/1973 Deitrick
3,866,249 A 2/1975 Flom
3,906,551 A 9/1975 Otter
3,913,148 A 10/1975 Potthast
4,010,496 A 3/1977 Neefe

(Continued)

FOREIGN PATENT DOCUMENTS

DE 4340205 4/1995
FR 1279252 12/1961

Primary Examiner—William H Matthews
(74) *Attorney, Agent, or Firm*—Berenato, White & Stavish, LLC

(57) **ABSTRACT**

An intraocular lens is provided that includes an optic body having anterior and posterior walls, a chamber, and optically transmissive primary and secondary fluids, and method for making and using the same. The secondary fluid is substantially immiscible with the primary fluid and has a different density and a different refractive index than the primary fluid. The primary fluid is present in a sufficient amount that orienting optical body optical axis horizontally for far vision positions the optical axis through the primary fluid, thereby immersing the anterior and posterior optical centers in the primary fluid. The secondary fluid is contained in the optic body in a sufficient amount that orienting the optical axis over a range of effective downward angles relative to the horizontal for near vision positions the optical axis to extend through the primary fluid and the secondary fluid, thus changing the focus of the intraocular lens.

13 Claims, 16 Drawing Sheets